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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/022,834	02/13/1998	STEFAN DEGENDT	98.162	6138

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EXAMINER
AHMED, SHAMIM

ART UNIT	PAPER NUMBER
1765	

DATE MAILED: 05/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/022,834	DEGENDT ET AL.	
	Examiner	Art Unit	
	Shamim Ahmed	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *27-39 and 41-60* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *27-39,41-60* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 2/20/03 and 4/28/03 have been fully considered but they are not persuasive. Applicants argue that Kashiwase et al teaches away from the adding of chemicals, such as additives, with ozone by pointing out that the adding of chemicals, such as sulfuric acid, with ozone is not recommended.

This is not persuasive because it is true that Kashiwase et al teach that it is not recommended to add sulfuric acid to the ozone solution but the teaching does not exclude to add any other additives to the solution in order to increase the performance of the ozone solution.

Furthermore, the combination of Sehested's teaching of addition of additive, such as acetic acid with ozone into the kashiwase et al's process is beneficial by stabilizing the ozone in the solution, which would provide increased efficiency of the ozone during the removal of organic materials.

As to the supplemental response filed on 4/28/03, Applicants argue that evidence of the non-obviousness of the present claims are shown in the specification pages 16-18, which represents experimental data of the cleaning efficiency of aqueous ozone with and without the scavenger acetic acid.

In response, examiner states that this is not persuasive because Applicants do not show any comparative data between the present claims and the applied prior art. Applicants should show a comparative study of the cleaning efficiency between the

present claims and the applied prior art by showing that the combined kashiwase et al do not perform the similar cleaning efficiency as the instant invention.

Therefore, the claims are still rejected as the previous office action mailed 8/12/02, which is repeated below.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 27-28, 30-32,34-39, 41-43, 48-49, 51-54,57 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashiwase et al (5,378,317) in view of Sehested (J.Phys. Chem.)

Kashiwase et al disclose a method for removing organic film after an etching process wherein, substrates having the organic film emerged in an ozone- processing tank, in which ozone is injected as bubble into water.

As to claims 28,30-32 and 54, Kashiwase et al teach that the temperature in the ozone-processing tank is maintained at a preferable range of 40 to 100^0 C (col.4, lines 21-59).

As to claims 15-16,20 and 31, Kashiwase et al teach that after the ozone treatment the substrate is rinsed utilizing a fluid such ultra pure water (col.6, lines 26-32 and also see the example 6).

As to claim 35-36, kashiwase et al teach that organic contamination is a confined layer (col.5, lines 39-41).

As to claim 43, Kashiwase et al teach that ozone bubbles are contacted with the organic contaminants (col.4, lines 28-32).

With the respect of the claims limitation 33,47 and 55: It would have been obvious to one having ordinary skill in the art at the time of claimed invention to incorporate megasonic agitation during cleaning process because it is mostly commonly used particle removal techniques for silicon wafer cleaning as taught by Kern (page 420, paragraph no. 5.3).

Kashiwase et al remain silent about the introduction of an additive such as acetic acid acts as OH radical scavenger.

However, Sehested et al teach that acetic acid acts as OH radical scavenger in aqueous ozone solution to stabilize ozone in the solution (see the introduction, page 1005).

Sehested et al also teach that the concentration of acetic acid is less than 1% molar weight (see result section at page 1006).

Therefore, it would have been obvious to one skilled in the art at the time of claimed invention to combine Sehested et at's teaching into Kashiwase et al's method to stabilize ozone in the cleaning solution as taught by Sehested et al.

4. Claims 33,47 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashiwase et al (5,378,317) in view of Sehested (J.Phys. Chem.) as applied to

claims 27-28, 30-32,34-39, 41-43, 48-49, 51-54,57 and 60 above, and further in view of Kern (Hand Book of Semicopnductor Wafer Cleaning technology).

Kashiwase et al modified with Sehested et al above in the paragraph 3 but fail to teach the introduction of a megasonic agitation.

However, It would have been obvious to one having ordinary skill in the art at the time of claimed invention to incorporate megasonic agitation during cleaning process because it is mostly commonly used particle removal techniques for silicon wafer cleaning as taught by Kern (page 420, paragraph no. 5.3).

Therefore, it would have been obvious to one skill in the art at the time of claimed invention to combine Kern's teaching into modified Kashiwase et al's method because megasonic agitation in the cleaning solution would enhance the removal of the contaminants as taught by Kern.

5. Claims 29,44-46,50 and 58-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashiwase (5,378,317) in view of Kern and Sehested et al (J.Phys.Chem.) as applied to claims 27,49 and 51 above, and further in view of Stanford et al (5,244,000).

Modified Kashiwase et al discussed above in paragraph No.3 but fails to teach the rinsing step of the substrate after cleaning step and the liquid can be sprayed. However, Stanford et al. describe a method for removing organic contaminants in which, liquid can be sprayed (col.9, lines 10-13).

Stanford et al. Further describe that after the substrate is treated for removal of contaminants, carbon dioxide is added to deionized water, which is applied to rinse or neutralize the treated substrate (col.7, lines 11-22).

Therefore, it would have been obvious to one skill in the art at the time of claimed invention to combine Stanford et al's teaching into modified Kashiwase et al's method for effective removal of organic contaminants from a substrate as taught by Stanford et al.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claim 49 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 27 of U.S. Patent No. 09/207,546. Although the conflicting claims are not identical, they are not patentably distinct from each other because the concentration of additive claimed in the application No. 09/207,546 is within the range of the instant application.

8. Obviousness-type double patenting rejection of claims 27,51 and 60 are still effective as the previous Office action mailed 3/22/01 (see paragraph No.7 and 8). Applicant's response filed 8/24/01 is acknowledged that upon allowance of claims in the present application, applicants will submit a terminal disclaimer in the co-pending application.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (703) 305-1929. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on (703) 308-3836. The fax phone

numbers for the organization where this application or proceeding is assigned are (703)-872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Shamim Ahmed
Examiner
Art Unit 1765

SA
April 30, 2003

BENJAMIN L. UTECH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700